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IMPLEMENTATION PLAN REVIEW FOR LOUISIANA REQUIRED BY THE ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT

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16. ABSTRACT

Section IV of the Energy Supply and Environmental Coordination Act of 1974, (ESECA) requires EPA to review each State Implementation Plan (SIP) to determine if revisions can be made to control regulations for stationary fuel combustion sources without interferring with the attainment and maintenance of the national ambient air quality standards. This document, which is also required by Section IV of ESECA, is EPA's report to the State indicating where regulations might be revised.

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IMPLEMENTATION PLAN REVIEW
FOR
LOUISIANA
REQUIRED BY THE ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT

PREPARED BY THE FOLLOWING TASK FORCE:

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U. S. Environmental Protection Agency
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1.0 EXECUTIVE SUMMARY

The enclosed report is the U. S. Environmental Protection Agency's (EPA) response to Section IV of the Energy Supply and Environmental Coordination Act of 1974 (ESECA). Section IV requires EPA to review each State Implementation Plan (SIP) to determine if revisions can be made to control regulations for stationary fuel combustion sources without interfering with the attainment and maintenance of the National Ambient Air Quality Standards (NAAQS). In addition to requiring that EPA report to the State on whether control regulations might be revised, ESECA provides that EPA must approve or disapprove any revised regulations relating to fuel burning stationary sources within three months after they are submitted to EPA by the States. The States may, as in the Clean Air Act of 1970, initiate State Implementation Plan revisions; ESECA does not, however, require States to change any existing plan.

Congress has intended that this report provide the State with information on excessively restrictive control regulations. The intent of ESECA is that SIP's, wherever possible, be revised in the interest of conserving low sulfur fuels or converting sources which burn oil or natural gas to coal. EPA's objective in carrying out the SIP reviews, therefore, has been to try to establish if emissions from combustion sources may be increased. Where an indication can be found that emissions from certain fuel burning sources can be increased and still attain and maintain NAAQS, it may be plausible that fuel resource allocations can be altered for "clean fuel savings" in a manner consistent with both environmental and national energy needs.

In many respects, the ESECA SIP reviews parallel EPA's policy on clean fuels. The Clean Fuels Policy has consisted of reviewing implementation plans with regards to saving low sulfur fuels and, where the primary sulfur dioxide air quality standards were not exceeded, to encourage States to either defer compliance regulations or to revise the SO_2 emission regulations. The States have also been asked to discourage large scale shifts from coal to oil where this could be done without jeopardizing the attainment and maintenance of the NAAQS.

To date, EPA's fuels policy has addressed only those States with the largest clean fuels saving potential. Several of these States have or are currently in the process of revising SO_2 regulations. These States are generally in the Eastern half of the United States. ESECA, however, extends the analysis of potentially over-restrictive regulations to all 55 States and territories. In addition, the current reviews address the attainment and maintenance of all the National Ambient Air Quality Standards.

There are, in general, three predominant reasons for the existence of overly restrictive emission limitations within the State Implementation Plans. These are 1) The use of the example region approach in developing State-wide air quality control strategies; 2) the existence of State Air Quality Standards which are more stringent than NAAQS; and 3) the "hot spots" in only part of an Air Quality Control Region (AQCR) which have been used as the basis for controlling the entire region. Since each of these situations affect many State plans and in some instances conflict with current national energy concerns, a review of the State Implementation Plans is a logical follow-up to EPA's initial appraisal of the SIP's conducted in 1972. At that time SIP's were approved by EPA if they demonstrated the attainment of NAAQS or more stringent state air quality standards. Also, at that time an acceptable method for formulating control strategies was the use of an example region for demonstrating the attainment of the standards.

The example region concept permitted a State to identify the most polluted air quality control region (AQCR) and adopt control regulations which would be adequate to attain the NAAQS in that region. In using an example region, it was assumed that NAAQS would be attained in the other AQCRs of the State if the control regulations were applied to similar sources. The problem with the use of an example region is that it can result in excessive controls, especially in the utilization of clean fuels, for areas of the State where sources would not otherwise contribute to NAAQS violations. For instance, a control strategy based on a particular region or source can result in a regulation requiring one percent sulfur oil to be burned state-wide where the use of three percent sulfur coal would be adequate to attain NAAQS in some locations.

EPA anticipates that a number of States will use the review findings to assist them in making the decision whether or not to revise portions of their State Implementation Plans. However, it is most important for those States which desire to submit a revised plan to recognize the review's limitations. The findings of this report are by no means conclusive and are neither intended nor adequate to be the sole basis for SIP revisions; they do, however, represent EPA's best judgment and effort in complying with the ESECA requirements. The time and resources which EPA has had to prepare the reports has not permitted the consideration of growth, economics, and control strategy tradeoffs. Also, there has been only limited dispersion modeling data available by which to address individual point source emissions. Where the modeling data for specific sources were found, however, they were used in the analysis.

The data upon which the reports' findings are based is the most currently available to the Federal Government. However, EPA believes that the States possess the best information for developing revised plans. The States have the most up-to-date air quality and emissions data, a better feel for growth, and the fullest understanding for the complex problems facing them in the attainment and maintenance of air quality standards. Therefore, those States desiring to revise a plan are encouraged to verify and, in many instances, expand the modeling and monitoring data supporting EPA's findings. In developing a suitable plan, it is suggested that States select control strategies which place emissions for fuel combustion sources into perspective with all sources of emissions such as smelters or other industrial processes. States are encouraged to consider the overall impact which the potential relaxation of overly restrictive emissions regulations for combustion sources might have on their future control programs. This may include air quality maintenance, prevention of significant deterioration, increased TSP, NO_x, and HC emissions which occur in fuel switching, and other potential air pollution problems such as sulfates

Although the enclosed analysis has attempted to address the attainment of all the NAAQS, most of the review has focused on total suspended particulate matter (TSP) and sulfur dioxide (SO_2) emissions. This is because stationary fuel combustion sources constitute the greatest source of SO_2 emission and are a major source of TSP emissions.

Part of each State's review was organizaed to provide an analysis of the SO_2 and TSP emission tolerances within each of the various AQCRs. The regional emission tolerance estimate is, in many cases, EPA's only measure of the "over-cleaning" accomplished by a SIP. The tolerance assessments have been combined in Appendix B with other regional air quality "indicators" in an attempt to provide an evaluation of a region's candidacy for changing emission limitation regulations. In conjunction with the regional analysis, a summary of the State's fuel combustion sources (power plants and industrial sources) has been carried out in Appendix C and D.

The State Implementation Plan Review has addressed the emissions from fuel combustion sources in each of Louisiana's three AQCRs. For your convenience, a map showing Louisiana and its AQCRs is shown. The major findings are as follows:

- As required by Section IV of ESECA, the Implementation Plan for the State of Louisiana has been reviewed with particular attention to the most frequent causes of overly restrictive emission limiting regulations. Even though the Example Region approach was used in the development of the control strategy, the regulation applicable to particulate emissions does not appear to be overly restrictive. Furthermore, there is evidence that substantial increases in particulate emissions could occur without relaxation of the existing regulations. NAAQS violations for TSP occur in each of the Louisiana AQCRs. In addition, the Shreveport area has been proposed as an AQMA. Also, with the exception of one source, all of the State's stationary fuel burning facilities are operating well within the emission limits established by the Louisiana particulate regulation.

- Based on 1973 air quality data, this review finds that SO_2 concentrations are below NAAQS. However, a determination that the current regulation for SO_2 is overly restrictive is beyond the scope of this review. The manner in which Louisiana regulates SO_2 is not directly related to the sulfur content of fuel. Instead, the SO_2 regulation specifies a maximum concentration to be observed beyond the premises where this source is located and/or in the stream to be discharged from the facility. It is not possible, therefore, to determine whether currently low ambient SO_2 levels are due to an overly restrictive regulation which could limit the use of certain fuels, or to an otherwise low level of SO_2 emissions. Also, EPA cannot help but suspect that the wide use of natural gas throughout Louisiana is not caused by the SO_2 regulation, but by the availability of natural gas.

- Natural gas is the major fuel used for the State's stationary fuel combustion sources, and accounts for 93% of all heat input to these types of facilities. Oil contributes 5%, while wood waste and other waste products provide the remaining 2%. Coal is not used as a fuel for any of these facilities.

Figure A-1. Air Quality Control Regions in Louisiana

Region #	Region Name
019	Monroe-El Dorado Interstate
022	Shreveport-Texarkana-Tyler Interstate
106	Southern Louisiana-Southeast Texas Interstate

2.0 STATE IMPLEMENTATION PLAN REVIEW

2.1 SUMMARY

A revision of fuel combustion source emissions regulations will depend on many factors. For example:

- Does the State have air quality standards which are more stringent than NAAQS?
- Does the State have emission limitation regulations for control of (1) power plants, (2) industrial sources, (3) area sources?
- Did the State use an example region approach for demonstrating the attainment of NAAQS or more stringent State standards?
- Has the State not initiated action to modify combustion source emission regulations for fuel savings; i.e., under the Clean Fuels Policy?
- Are there no proposed Air Quality Maintenance Areas?
- Are there indications of a sufficient number of monitoring sites within a region?
- Is there an expected 1975 attainment date for NAAQS?
- Based on reported (1973) Air Quality Data, does air quality meet NAAQS?
- Based on reported (1973) Air Quality Data, are there indications of a tolerance for increasing emissions?
- Is the fraction of total emissions from stationary fuel combustion sources higher than those of other sources?
- Do modeling results for specific fuel combustion sources show a potential for a regulation revision?
- Must emission regulations be revised to accomplish significant fuel switching?
- Based on the above indicators, what is the potential for revising fuel combustion source emission limiting?
- Is there a significant clean fuels savings potential in the region?

This report is directed at answering these questions. An AQCR's potential for revising regulations increases when there are affirmative responses to the above.

The initial part of the SIP review report, Section 2 and Appendix A, was organized to provide the background and current situation information for the State Implementation Plan. Section 3 and the remaining Appendices provide an AQCR analysis which helps establish the overall potential for revising regulations. Emission tolerance estimates have been combined in Appendix B with other regional air quality "indicators" in an attempt to provide an evaluation of a region's candidacy for revising emission limiting regulations. In conjunction with the regional analysis, a characterization of the State's fuel combustion sources (power plants and industrial sources) has been carried out in Appendix C and D.

Based on an overall evaluation of EPA's current information, AQCRs have been classified as good, marginal, or poor candidates for regulation revisions. These ratings which are shown in the Summary Table on Page 9 were determined by assessing the following criteria:

Good	Poor	Marginal
1) Adequate number of air monitoring sites	1) Violations of NAAQS	1) No air quality data or insufficient number of monitoring sites
2) No NAAQS violations	2) Attainment date for NAAQS later than 1975	2) Inconsistent "indicators"
3) Attainment date of 1975 for NAAQS in the SIP	3) Proposed AQMA	
4) No proposed AQMAs	4) Modeling results show no potential for regulation revision	
5) Modeling results show a potential for regulation revision		

For an AQCR to be rated as a good candidate, all of the criteria listed under "Good" would have to be satisfied. The overriding factor in rating an AQCR as a poor candidate is a violation of either the primary or secondary National Ambient Air Quality Standards during 1973. However, if any of the other conditions listed under "Poor" exists, the AQCR would still receive that rating. The predominant reason for a marginal rating is a lack of sufficient air quality data. Marginal ratings are also given when there are varying or inconsistent "indicators."

STATE IMPLEMENTATION PLAN REVIEW - LOUISIANA

SUMMARY TABLE

"INDICATORS"	STATE		AQCR 019		AQCR 022		AQCR 106	
	TSP	SO_2	TSP	SO_2	TSP	SO_2	TSP	SO_2
• Does the State have air quality standards which are more stringent than NAAQS?	NO	YES*						
• Does the State have emission limiting regulations for control of:								
1. Power plants	YES	YES[2]						
2. Industrial sources	YES	YES[2]						
3. Area sources	YES[1]	YES[2]						
• Did the State use an example region approach for demonstrating the attainment of NAAQS or more stringent State standards?	YES	YES						
• Has the State not initiated action to modify combustion source emission regulations for fuel savings; i.e., under the Clean Fuels Policy?	YES	YES						
• Are there no proposed Air Quality Maintenance Areas?			YES	YES	NO	YES	YES	YES
• Are there indications of a sufficient number of monitoring sites within a region?			YES	YES	YES	YES	YES	YES
• Is there an expected 1975 attainment date for NAAQS?			YES	YES	YES	YES	YES	YES
• Based on reported (1973) Air Quality Data, does air quality meet NAAQS?			NO	YES	NO	YES	NO	YES
• Based on reported (1973) Air Quality Data, are there indications of a tolerance for increasing emissions?			NO	YES	NO	YES	NO	YES
• Are the total emissions from stationary fuel combustion sources lower than those of other sources?			YES	YES	YES	YES	YES	YES
• Do modeling results for specific fuel combustion sources show a potential for a regulation revision?			N/A[3]	N/A[3]	N/A[3]	N/A[3]	N/A[3]	N/A[3]
• Must emission regulations be revised to accomplish significant fuel switching?			NO	NO	NO	NO	NO	NO
• Based on the above indicators, what is the potential for revising fuel combustion source emission limiting regulations?			POOR	N/A[4]	POOR	N/A[4]	POOR	N/A[4]
• Is there a significant Clean Fuels Saving potential in the region?			NO[5]	YES	NO[5]	YES	NO[5]	YES

Unless otherwise noted, N/A stands for "not applicable."

*Louisiana has secondary standards for SO_2 which are more stringent than the current federal standards for this pollutant.

[1]The State's particulate regulation for stationary fuel burning equipment does not explicitly limit itself to the kinds of equipment to which it applies. Therefore, one can only assume that it applies to all such equipment, including area fuel burning sources.

[2]Louisiana uses an ambient concentration property line regulation to control its SO_2 emissions, and it also places a limit on the maximum concentration of SO_2 that can be emitted. It appears that this regulation would apply to all sources not otherwise specifically covered (and therefore, area sources). But because of inherent enforcement difficulties of the property line portion of the regulation, its effectiveness for limiting emissions is decreased.

[3]There is no modeling data available which could serve as a basis for regulation revision decisions.

[4]There is no way to make a direct connection between the restrictiveness of the State's SO_2 regulation, and the resultant emissions using the methodology established for this review. Thus the air quality indicators referred to by the questions on this table cannot be used as a basis for decisions to revise emission limiting regulations.

[5]In that there are already NAAQS TSP violations in this AQCR, there is no potential for fuel switches aimed at effecting clean fuel savings.

2.2 AIR QUALITY SETTING FOR THE STATE OF LOUISIANA

The State of Louisiana is one of five states in EPA Region VI (the others are Arkansas, New Mexico, Oklahoma and Texas). Louisiana is divided into three AQCRs. These are listed below:

019 - Monroe - El Dorado Interstate

022 - Shreveport - Texarkana- Tyler Interstate

106 - Southern Louisiana - Southeast Texas Interstate

The three digit number in the above listing has been assigned by EPA as a part of a nationwide numbering system for all AQCRs. The boundaries of an AQCR are designed to enclose an airshed. All of Louisiana's AQCRs have boundaries which cross State lines, (i.e., are interstate AQCRs).

Tables A-1, A-2 and A-3 summarize additional general information that helps characterize the air quality and provides other related statistics about the AQCRs. In Table A-1 the following information is presented:

1) Priority classifications for the pollutants under study

2) Demographic data

3) Parishes within the State that are proposed Air Quality Maintenance Areas (AQMAs).

4) The States with which Louisiana shares its interstate AQCRs.

Priority classifications give a quick indication of the extent to which certain pollutants pose air quality problems for the AQCR. A Priority I listing indicates that relatively high ambient concentrations of the pollutant have been either observed, estimated (in the absence of adequate measured air quality data), or predicted due to expected future sources. A Priority III designation is used when pollutant concentrations are generally lower than NAAQS. Table A-1 indicates that the Southern Louisiana-Southeast Texas (106) AQCR is classified Priority I for SO_2, while the other two AQCRs have Priority III classifications for this pollutant. With regards to particulates, all AQCRs are designated Priority II.

The SIP describes the Southern Louisiana-Southeast Texas (106) AQCR as the most heavily industrialized in the State with most of the activity centering around the oil and gas industry. The industrial activities in this AQCR may account for its high pollutant levels.

The demographic characteristics of the AQCRs are included in Table A-1 to further describe the various regions.

Proposed Air Quality Maintenance Area (AQMA) designations are a way of identifying those areas in the State which, due to current air quality and/or projected growth rate, may have the potential for exceeding any national standard within the ten year period 1975-1985. These designations are proposed by either the State, or by the Regional EPA office. If an area ultimately becomes an AQMA, it is likely that more restrictive changes will have to be made to existing regulations and/or air pollution control plans. It will be noted that the Shreveport area has been proposed as an AQMA for TSP.

Table A-2 presents the dates when the ambient level of the pollutants under study is expected to be within the limits set by NAAQS. The fact that none of the dates are delayed from the July 1975 date originally prescribed by law indicates that no major problems are foreseen for the achievement of NAAQS.

A summary of the Federal and Louisiana ambient air quality standards for the pollutants under study is presented in Table A-3. With the exception of the secondary annual and 24-hour standards for SO_2, all State standards are equivalent to NAAQS.

Compared to the general air quality information presented in Tables A-1 and A-2, the data in Tables A-4 and A-5 provides a more detailed picture of the State's recent (1973) air quality setting. In Table A-4 there is evidence of a widespread particulate problem that did not seem to be present during 1971 when the SIP was being written. Though the SIP originally reported an annual geometric mean (AGM) of 119 $\mu g/m^3$, further investigation after submittal of the plan showed the correct recorded value

was 89 $\mu g/m^3$. Data from 1973 shows the annual level to be 138 $\mu g/m^3$, while the 24-hour high was 747 $\mu g/m^3$. And though these (the State's highest) values were recorded in the Southern Louisiana-Southeast Texas AQCR (106), NAAQS TSP violations occurred in each of the other two AQCRs.

On the other hand, SO_2 levels measured in 1973 (and shown in Table A-5) are generally quite low. None were in excess of the highest SO_2 value reported in the SIP (220 $\mu g/m^3$, AAM). The highest annual reading reported for 1973 was 16 $\mu g/m^3$. The highest ambient SO_2 value measured anywhere in the three AQCRs was 205 $\mu g/m^3$, a 24-hour measurement made in Texas. Louisiana's highest SO_2 measurement was a 24-hour reading of 83 $\mu g/m^3$. The one consistent factor about the high SO_2 readings from the SIP and those recorded in 1973 was that they all occurred in the Southern Louisiana-Southeast Texas AQCR.

Table A-6 provides a listing by AQCR of the number of the State's power plants and other fuel combustion point sources that produce particulate and SO_2 emissions. The total given for each of the AQCRs applies to only those portions which lie within Louisiana. Inclusion of both NEDS, and FPC data serves to not only note the existence of more than one source of information, but also points up data inconsistencies. It can also be seen that a number of power plants are planned for future operation in the State.

The most current data available was used to compile the SO_2 and particulate emissions data shown in Tables A-7 and A-8, namely emissions from the NEDS data bank. The Southern Louisiana-Southeast Texas AQCR (106) accounts for most of the emissions that originate within the State (88% of the SO_2 emissions, and 83% of the particulate emissions).

Information presented in the SIP indicates that most of the emissions in this AQCR result from process sources. For particulates, 89% of the emissions were said to be due to process sources, while all other sources supplied the remaining 11%. The breakdown for SO_2 was 91% for process sources, 7% for transportation, and 2% for other contributors. It should be pointed out that these figures represent the emissions mix that existed prior to January 1972 when the SIP was submitted. It is not known how accurately this breakdown exemplifies 1973 or current emissions. However, examination of the 1972 data presented in Tables A-7 and A-8 tends to suggest

continuance of a similar trend. While this data does not indicate the proportion of emissions that are due to process sources, it does show that only 16.9% of the SO_2 emissions, and 8.5% of the particulate emissions, are due to fuel combustion. Because of their relatively small contribution of emissions on a statewide basis, it is very possible that fuel combustion processes would have a correspondingly small effect on air quality when compared with the effect of process sources. A more detailed study would be required to determine the extent of this assumption. However, fuel combustion sources could have significant localized effects on air quality.

2.3 BACKGROUND OF THE DEVELOPMENT OF THE CURRENT STATE IMPLEMENTATION PLAN

According to the SIP, the basis of Louisiana's air pollution control activity is the State's Revised Statutes 40:2201 et. seq. including amendments. This document, known as the Louisiana Air Control Law, established the Air Control Commission which periodically adopts and promulgates rules and regulations aimed at controlling air pollution.

The SIP describes Louisiana's control strategy for the attainment and maintenance of NAAQS in terms of a series of strategems. These are listed below to give the reader a general feel for Louisiana's approach to air pollution control.

1. Compliance with existing emission standards, or with proposed standards after they have been adopted.

2. Where compliance with existing standards is proven to be infeasible (as is sometimes the case with older plants), accept only the best demonstrated levels of emissions of similar processes in plant scale operations found in Louisiana, as well as in other portions of the United States.

3. Concentrate actions on principle emitters for emission reductions.

4. Require all emitters in violation of standards or regulations to reduce emissions regardless of source size.

5. Require similar or like processes to attain technologically equal reductions.

6. Use a statewide uniform approach.

7. Resort to limited control of land use pertaining to air pollution emissions through permit system when other strategems do not give adequate reduction.

8. Consider financial hardship in requiring emission reductions particularly with older plants.

9. For new sources, require compliance with emission limitations attainable with reasonable available technology as given in the Federal Register.

10. Control automobile exhaust emissions in principle urban areas where needed to meet ambient air standards or in case of emergency air pollution episodes.

The SIP anticipates that the combination of strategems 1 and 2 will result in bringing air quality in Louisiana to a level that is in compliance with NAAQS. The SIP includes a demonstration of this compliance by using the proportional rollback and Air Quality Display models as applied to the emissions of an Example Region.

Considering the area's many sources, high emission levels, and NAAQS violations, it is no surprise that the Southern Louisiana-Southeast Texas AQCR (106) was used as the Example Region. When the proportional rollback model was applied to the highest TSP and SO_2 values recorded in this AQCR, it was ascertained that emission reductions of 50 and 64 per cent respectively would be required to attain NAAQS. Calculations were performed to predict the magnitude of emission reductions expected from applying State emissionsregulations. For particulates this was done for three metropolitan areas within the Southern Louisiana-Southeast Texas AQCR. The results are shown below:

Area	Anticipated Percentage Reduction by Applying State Regulations
A. New Orleans	60%
B. Baton Rouge	84%
C. Lake Charles	54%

It can be seen that the 50% reduction needed to achieve secondary TSP standards is attained in all three areas.

The SO_2 emissions rollback of 64% was based on an ambient measurement of 220 $\mu g/m^3$ (AAM) in the Baton Rouge area. (The ambient SO_2 levels in the other areas were below NAAQS.) It was shown that application of the State's regulations in the Baton Rouge area would result in an emission reduction of 61%. This value was sufficiently close to the 64% requirement to assume adequacy of the regulation. EPA approved the SIP's control strategies for both SO_2 and particulates.

The State's emission limiting regulations for fuel burning equipment are summarized in Table A-9. While the regulation for particulates applies specifically to fuel burning equipment, the applicable SO_2 emission regulation has subsections which apply to each of differing industries. These subsections state specific limits for 1) refineries (and other industries that have process gas streams containing hydrogen sulfide), 2) sulfuric acid production plants, and 3) sulfur recovery plants. An additional subsection gives the limit for all other SO_2 emitters which are not otherwise specifically covered by the other subsections. Fuel burning equipment falls into this category.

Attention should be brought to the differences between the formats of the regulations for particulates and SO_2. The particulate regulation relates the amount of allowed emissions directly to the amount of fuel burned (pounds of particulates per million Btu). The SO_2 regulation is stated in terms of ambient SO_2 concentrations observed at any point beyond the premises where the source is located. Regulations written using this format are sometimes referred to as "property line regulations," and they are often considered to have inherent enforcement problems. However, of greater importance here is the fact that the format of this type of regulation precludes evaluation of its restrictiveness using the methodology established for this review. Thus, little can be said about whether the low ambient SO_2 levels observed in Louisiana are due to the applicable regulation, to low baseline emissions, or to some other factor.

2.4 SPECIAL CONSIDERATIONS

In accordance with 40 CFR Part 51, maintenance of National Ambient Air Quality Standards, published in the June 18, 1973 Federal Register, States

were to submit by March 18, 1974, proposals for Air Quality Maintenance Area (AQMA) Designations. This requirement was not met by the State of Louisiana. Thus, the responsibility fell to EPA to propose AQMA designations for the State. Officials in the Regional EPA Office used air quality data for the years 1972 and 1973 to arrive at the proposed AQMA designations referred to in Section 2.2 of this review.

Many of Louisiana's air pollution control regulations have subsections which restrict the degradation of the existing emission or air quality levels that are better than the regulation requires. A non-degradation provision is a part of the regulation which establishes the State's air quality standards. It is also included in each of the regulations which stipulate particulate and SO_2 emission limits for fuel burning equipment. Thus, Louisiana's current regulations have provisions which specifically restrict the kinds of emission increases (and corresponding air quality changes) that would be a part of the clean fuel savings being discussed in this review. Therefore, these and other similar provisions of Louisiana's Air Control Law may pose additional problems for any plans aimed at relaxing emission regulations.

According to the particulate control strategy section (revised May 5, 1973) of the SIP, the Chalmette works of the Kaiser Aluminum and Chemical Company, located in AQCR 106), is not expected to have its pollution abatement facilities completed until after May 31, 1975. But based on their emission figures (from 1970, and 1972), Kaiser's proposed emission reduction plan is expected to achieve the rollback required to attain primary standards as predicted by the proportional model. However, this section of the SIP did not deal with whether this facility would be able to achieve the rollback that would be necessary for compliance with secondary standards. Recent review of emission data and application of rollback procedures indicate that secondary standards can be achieved by the required date.

EPA has not yet approved Louisiana's smelter regulation. And though this does not relate directly to fuel burning facilities, it does represent a part of the SIP that is not approved. Also, since process sources are the

major emitters in the State, the manner in which any one of them is controlled may have a substantial effect on the air quality in the immediate area of the source. Conceivably, if emissions from process sources can be decreased sufficiently, then the corresponding attainment of air quality may allow for increased emissions from fuel combustion sources so that clean fuel savings could be achieved.

3.0 AQCR ASSESSMENTS

3.1 REGIONAL AIR QUALITY

Tables A-10 and A-11 present the results when the proportional model is used to estimate tolerance for emissions increase. This display should be viewed in light of the limitations mentioned in Section 1.0. The portion of these tables that apply to SIP information was included as a means of summarizing the emission control goals of the State. However, Louisiana's Plan lacked the detailed air quality and emissions data necessary for this type of analysis.

Tables B-1 and B-2 are summaries of some of the indicators which should be considered when estimating the potential for regulation relaxation. The overall regional evaluations listed on these tables are based upon consideration of these indicators, and on the more comprehensive summary of indicators referred to in the beginning of Section 2 of this report.

Based on the information presented in Tables A-11 and B-1, it can generally be said that any increase in particulate emissions would tend to aggravate an air quality situation which is typified by TSP violations in each of Louisiana's three AQCRs.

Furthermore, there is evidence that substantial increases in particulate emissions could occur without relaxation of the existing emission regulations. Data presented in Appendices C and D shows that virtually all of the State's major power plants and industrial sources are operating well within the limits of Louisiana's particulate emission regulation. Thus, oil (which has particulate emissions which are substantially higher than gas on a per million Btu basis), could be substituted for gas in those plants which have dual fuel capability. This would result in a significant increase in particulate emissions, and based on the State's 1972 emission levels of this equipment, this switch could be made without exceeding the 0.6 lbs/10^6 Btu limit set by the regulation. So considering that TSP violations are widespread and that sizeable particulate emission increases could occur within the limits of the existing regulation, it does not appear that this regulation is overly restrictive.

Tables A-10 and B-2 both show that each of Louisiana's AQCRs have a a tolerance for increased SO_2 emissions. However, as it was stated previously, the format of Louisiana's SO_2 emission regulation does not lend itself to an evaluation of its restrictiveness using the methodology established for this review. Thus, it cannot be said, at this time, whether the low levels are due to the over restrictiveness of the regulation. But it should be noted that the problems associated with the enforcement of property line regulations tend to lessen that regulation's overall restrictiveness, and this is in spite of any intended stringency of the numerical limits of these regulations. Furthermore, an emission control regulation for which the numerical limit is an ambient concentration does not really set an emission limit. This is because the prescribed ambient concentration maximum could result from a wide range of emission levels depending on factors such as those listed below:

the way the fuel is burned
areal topography
location of monitors
meteorology
stack heights
characteristics of the exhaust gases
(e.g. exit velocity, temperature, etc.)

Thus the above discussion tends to suggest that the low SO_2 levels are not due to the over restrictiveness of the State's emission control regulations. A low level of baseline emissions is another possible cause, but analysis of this point is outside the scope of this review.

The fact that there is a tolerance for increased SO_2 emission in the State of Louisiana suggests that clean fuel savings involving this pollutant could possibly be achieved by switching to a fuel with a higher sulfur content. This may involve using residual oil or high sulfur oil rather than natural gas or distillate oil. Some equipment may even be able to utilize coal as a heat source. The degree to which such a switch could take place and still not cause NAAQS SO_2 violations is unknown. A more extensive study (most likely requiring modeling data) would have to be performed to answer this question. However, it should be noted that most of the fuel switches that could generally be utilized

for increasing SO_2 emissions (i.e. use of residual oil, high sulfur oil, or coal instead of gas) would also produce corresponding increases in particulate emissions, and thus further aggravate the State's TSP situation.

3.2 STATEWIDE FUEL USE

According to NEDS emission information listed for the individual stationary fuel burning sources in Louisiana, the major fuels can be categorized as: natural gas, oil (including distillate and residual oils), and wood and waste fuels (including wood waste products, bagasse, and waste from other processes). Table B-3 summarizes the contributions of each of these fuels to the State's total heat input budget. Natural gas undoubtedly provides the major segment of the heat input to the State's stationary fuel burning equipment. On a Btus/hour basis, natural gas accounts for 93% of the State's total heat input. Oil contributes a total of 5%, while the general category of wood and waste fuels provide the remaining 2%. This last group is composed primarily of the recoverable combustible materials that accumulate as waste from various industrial and agricultural processes within the State. It appears that wood is the major fuel in this category. The SIP indicates that lumber and pulp mills are relatively numerous in the Monroe-El Dorado and Shreveport-Texarkana-Tyler AQCRs. (The former has two pulp mills and 43 lumber mills, while the latter has two pulp mills and 66 lumber mills.) Presumably, some of these facilities burn wood waste products in boilers to produce process steam. Bagasse is the cellulose material that remains after the processing of sugar cane. This is also used as a fuel in some of the State's industrial sources.

Though the SIP indicates the major economic activity in the Southern Louisiana-Southeast Texas AQCR (106) centers around the oil and gas industry, it should be noted that 74% of all the wood and waste fuel which is used in the State's fuel combustion equipment is consumed in the Southern Louisiana-Southeast Texas AQCR.

Louisiana's industrial facilities are the only stationary fuel combustion sources in the State which utilize wood and other waste products as fuel. In calculating the contribution of these materials to the State's heat input budget, a value of 5000 Btu/lb was used as a very rough estimate of their average heat content. The heat value of the different fuels that

comprise wood and waste fuel categories vary widely depending on their composition and moisture content. For relatively dry wood, heat contents typically range between 6000-8000 Btu/lb. At the other end of the scale are crop wastes and other organic materials which have heat values ranging from 3000 to 6000 Btu/lb. Because of the variability of heat values, moisture content, and resultant emissions of the individual fuels in this category, the 5000 Btu/lb estimate has been used solely in those calculations aimed at providing a first approximation of the relative importance of these materials as fuels within Louisiana. Therefore, no attempt will be made either in the following assessment sections, or in the Appendices, to discuss the impact that combustion of the materials would have on emissions and air quality, or whether the equipment using these materials are operating within the State's emission regulations.

3.3 POWER PLANT ASSESSMENT

The tables that comprise Appendix C provide a listing of the power plants in the State along with a general description of each plant's emission characteristics. This listing and information was obtained from the NEDS data on individual sources. It should be noted that there is a discrepancy between this listing and that obtained from other sources of data, (namely, NEDS rank order listing, the Steam-Electric Plant Factors publication, and the FPC data retrieved from EPA data banks).

The discrepancy includes not only differences in the total number of plants, but also in how they are distributed among the AQCRs. No attempt will be made to resolve this discrepancy. It is mentioned here only to bring to the reader's attention the fact that data discrepancies do occur. For the purpose of this review, the information presented in Appendix C will be the basis for all further discussion and computations.

As shown in Table C-1, the State of Louisiana has a total of 21 power plants, ranging in size from 25 megawatts electric (Mwe) to 1884 Mwe. The State's total capacity is 10,185 Mwe. As indicated previously, natural gas is the major fuel used, providing 88.7% of the heat input to all power plants

in the State. Residual oil is the second most utilized fuel for power plants, while distillate oil makes up the remainder. NEDS data shows no coal burning power plants in the State. Information obtained from Steam-Electric Plant Factors shows that Louisiana's existing power plants were originally designed for oil and gas, or gas alone. This publication also shows that of the new plants planned for operation between 1974 and post-1978 (see bottom of Table A-6), most are designed for a gas-oil dual fuel capability. There is only one coal-burning power plant planned for Louisiana.

Power plants seem to be concentrated in the Southern Louisiana-Southeast Texas AQCR (106). This one AQCR accounts for 9195 Mwe of the State's total 10,185 Mwe capacity, a total of 90.2%. This figure reflects not only the much higher population density of this area, but also the high level of economic and industrial activity mentioned in an earlier Section of this review.

While the particulate emissions from the oil burning equipment in power plants is generally greater than emissions from its gas burning counterparts, Louisiana's power plants all seem to have been operating well within the limits imposed by the State's particulate emission regulation. Furthermore, the general emission level of power plants seems to be lower than that of the industrial sources. Because of the property line format of Louisiana's SO_2 emission regulation, it cannot be ascertained whether individual sources are in violation.

3.4 INDUSTRIAL/COMMERCIAL/INSTITUTIONAL SOURCE ASSESSMENT

Table D-1 presents the pertinent fuel combustion data for point sources in the industrial/commercial/institutional sector (commonly referred to as the industrial sector in this review). This information was obtained from NEDS emission data for the individual sources.

There are 13 specific sources listed in Table D-1. However, there are numerous other fuel burning facilities in Louisiana that would fall into the industrial category. Because of their number, it was decided to list only those industrial sources which had particulate or SO_2 emissions greater than 100 tons per year. The remaining industrial sources were grouped together according to the type of fuel used, and the relevant characteristics (fuel use, heat input, emissions, etc.) were totalled for each of these groups.

As with other stationary fuel burning facilities within the State, natural gas is the major fuel used for Louisiana's industrial sources. Three of the thirteen identified sources utilize oil as a fuel, but in each of these cases natural gas provides most of the plant's heat input.

It is not known to what extent any of the remaining sources (both those individually listed in Table D-1, and those unlisted) can effectively switch to a dirtier fuel.

In general it can be said that the State's industrial sources are all operating within the emission limits imposed by the applicable particulate regulation. In fact, the only place where a violation is indicated is for the aggregated emissions (from the unlisted sources) due to residual oil combustion in the Shreveport-Texarkana-Tyler AQCR (022).

With regards to the SO_2 regulation, the comments made in the power plant assessment section of this review also apply for industrial sources.

3.5 AREA SOURCE ASSESSMENTS

The provisions of ESECA were aimed at power plants and other major stationary fuel combustion sources. For this reason, area fuel burning sources offer little, if any, potential for achieving clean fuel savings within the context of ESECA.

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APPENDIX A

- State implementation plan information
- Current air quality information
- Current emissions information

Tables in this appendix summarize original and modified state implementation plan information, including original priority classifications, attainment dates, ambient air quality standards, and fuel combustion emission regulations. SAROAD data for SO_2 and TSP monitoring stations are shown for AQCRs in the State. NEDS emissions data by AQCR[1] are tabulated and broken down into fuel burning categories.

Tables A-10 and A-11 show a comparison of emission inventories in the original SIP and those from the NEDS. An emission tolerance, or emission tonnage which might be allowed in the AQCR and still not violate national secondary ambient air quality standards, is shown for SO_2 and particulates. The intent of this calculation is to indicate possible candidate regions for fuel switching. Tolerance was based on either the degree of control expected by the SIP or upon air quality/emission relationships which are calculated from more recent data. The value of the emission tolerance provides an indication of the degree of potential an AQCR possesses for fuel revisions and regulation relaxation.

Methodology for Increased Emissions Tolerance

A tolerance for increased emissions was determined as follows: The "allowable emissions" were calculated for each AQCR based on 1972 NEDS data and the percent reduction (or increase) required to meet the national secondary ambient air quality standards in that AQCR (worst case from Tables A-4 and A-5).

The percentages used in this calculation were obtained via the use of current 1973 air quality data and the proportional rollback model. The values for background TSP concentrations were the same as those used in the SIP. This background value was used in all calculations involving the annual standard, but a zero TSP background was assumed for the calculation of reductions based on the 24-hour standard. (This was done because background levels are, in effect, an annual average, and therefore, should be

[1] "1972 National Emissions Report," EPA - 450/2-74-012, June 1974.

compared with only annual data. It is reasonable to expect that the "real background" for any particular 24-hour period to be different for other 24-hour periods.)

The NEDS emissions are subtracted from the "allowables" to determine the tolerance for emissions increase. A positive value for this result indicates a potential for increasing emissions.

When the current air quality levels were less than one-half of the level represented by an ambient air quality standard, no "rollup" emissions tolerance was calculated in Tables A-10 and A-11. This arbitrary cutoff point was chosen so as not to distort the emissions tolerance for an area. At low levels of a pollutant, the relationship between emissions and air quality is probably not linear. Although this cutoff may leave some AQCRs with no quantifiable emissions tolerance, it was felt that no number at all would be preferable to a bad or misleading number.

It is emphasized that emissions tolerance is a region-wide calculation. This tolerance obviously makes more sense in, say, an urban AQCR with many closely spaced emissions sources than in a largely rural AQCR with geographically dispursed emissions.

A word of caution regarding particulates needs mentioning. Emission source estimates in the NEDS data bank and most state SIP's are for total particulates. Generally, the control strategies for particulates are aimed at total particulates, while the high-volume particulate sampling (SAROAD data) measures only the finer, suspended fraction. A given level of total particulate emissions control will therefore not translate into the same level of measured ambient air quality. Some of the larger particulates being controlled will not remain suspended, and therefore would not be measured by the High-volume technique. Hence, particulate control plans may have underestimated the amount of control necessary to achieve ambient air quality standards.

Table A-1. AQCR Priority Classification and AQMAs

AQCR	AQCR #	Priority Classification			Demographic Information[d]			Proposed AQMA Designations[e]		
		Part.[b]	SO_x[a]	NO_x[c]	Population 1970	Square Miles	Population Density	TSP Parishes	SO_x Parishes	NO_x Parishes
Monroe - El Dorado (Ark-La)	019	II	III	III	319,722	8,284	38.6	None[f]	None[f]	None[f]
Shreveport-Texarkana-Tyler (Ark.-La-Okla-Tex)	022	II	III	III	519,669	9,424	55.1	Bossier, Caddo and Webster.	None[f]	None[f]
Southern Louisiana-S.E. Texas (La-Tex)	106	II	I	III	2,801,915	27,226	102.9	None[f]	None[f]	None[f]

Priority	I Greater than	II From-To	III Less than
[a] Sulfur oxide:			
Annual arithmatic mean..	100	60-100	60
24-hour maximum.....	445	260-455	260
[b] Particulate matter:			
Annual geometric mean...	95	60- 95	60
24-hour maximum.....	325	150-325	150
[c] Nitrogen dioxide	110		110

[d] Based on information provided in the SIP. These statistics apply only to the Louisiana portion of the AQCRs.

[e] As indicated in the Proposed Air Quality Maintenance Area Designations for Louisiana:Background and Rationale, EPA, Region VI

[f] For the Louisiana portion of the AQCR only

Table A-2. Attainment Dates[b] - Louisiana

AQCR #	AQCR Name	Particulates Attainment Dates		Sulfur Dioxide Attainment Dates		Nitrogen Oxides Attainment Dates
		Primary	Secondary	Primary	Secondary	
019	Monroe - El Dorado	7/75	7/75	a	a	a
022	Shreveport-Texarkana-Tyler	7/75	7/75	a	a	a
106	Southern Louisiana-S.E. Texas	7/75	7/75	7/75	7/75	a

a) Air Quality was better than levels indicated by secondary standards at the time these attainment dates were formalized.

b) Based on information supplied by EPA-Durham

Table A-3. Ambient Air Quality Standards - Louisiana (Expressed as $\mu g/m^3$)

		Total Suspended Particulate		Sulfur Oxides			Nitrogen Dioxide
		Annual	24-Hr.	Annual	24-Hr.	3-Hr.	
Federal (Nov. 1972)	Primary	75(G)	260[a]	80(A)	365[a]	-	100(A)
	Secondary	60(G)	150[a]	-	-	1300[a]	100(A)
State[b]	Primary	75(G)	260[a]	80(A)	365[a]	-	100(A)
	Secondary	60(G)	150[a]	60(A)	260[a]	1300[a]	100(A)

(A) = Annual arithmetic mean
(G) = Annual geometric mean

a Not to be exceeded more than once per year

b As revised Nov. 21, 1972, Louisiana's ambient air standards for the above pollutants were identical to the Federal Standards that existed before EPA dropped the secondary standards for SO_2.

Table A-4. Louisiana AQCR Air Quality Status (1973), TSP[a]

AQCR Name	AQCR #	# Stations Reporting	TSP Concentration ($\mu g/m^3$) Highest Reading Annual	Highest Reading 24-Hr	2nd Highest Reading 24-Hr	# Stations Exceeding Ambient Air Quality Standards Primary Annual	Primary 24-Hr[c]	Secondary Annual	Secondary %	Secondary 24-Hr[c]	Secondary %	% Reduction[d] Required to Meet Standards	Standard on Which % Reduction Is Based
1. Monroe - El Dorado	019[b]	8	63	254	217	0	0	1	12	4	50	25	24-hr
	(La.)	3	63	254	217	0	0	1	33	3	100	25	24-hr
2. Shreveport - Texarkana - Tyler	022[b]	11	81	580	168	1	0	3	27	4	36	38	annual
	(La.)	3	-	237	157	-	0	-	-	2	67	4	24-hr
3. Southern Louisiana - Southeast Texas	106[b]	18	138	747	505	3	1	9	50	7	39	70	24-Hr
	(La.)	6	77	250	166	1	0	1	17	2	33	33	annual

[a] 1973 air quality data is National Air Data Bank as of June 7, 1974.

[b] Interstate

[c] Violations based on 2nd highest reading at any station

[d] Formula $\left[\left(\frac{\text{2nd Highest 24 Hr - 24 hr Secondary Standard}}{\text{2nd Highest 24 Hour}} \right) \times 100, \left(\frac{\text{Annual - Annual Secondary Standard}}{\text{Annual - Background}} \right) \times 100 \right]$

TSP - Background = 25 $\mu g/m^3$ as used in SIP

Table A-5. Louisiana AQCR Air Quality Status (1973), SO_2[a]

AQCR Name	AQCR #	# Stations Reporting 24-Hr (Bubbler)	# Stations Reporting (Contin.)	SO_2 Concentration ($\mu g/m^3$) Highest Reading Annual	Highest Reading 24-Hr	2nd Highest Reading 24-Hr	# Stations Exceeding Ambient Air Quality Stds. Primary Annual	Primary 24-Hr[c]	Secondary 3-Hr	% Reduction[d] Required To Meet Standards	Standard on Which % Reduction Is Based
1. Monroe - El Dorado	019[b]	3	-	3	61	60	0	0	-	e	-
	(La.)	1	-	3	11	10	0	0	-	e	
2. Shreveport - Texarkana - Tyler	022[b]	7	-	7	25	13	0	0	-	e	-
	(La.)	2	-	7	25	13	0	0	-	e	
3. Southern Louisiana - Southeast Texas	106[b]	19	5	16	205	63	0	0	0	e	-
	(La.)	13	4	16	83	35	0	0	0	e	

[a] 1973 air quality data is National Air Data Bank as of June 7, 1974.

[b] Interstate.

[c] Violations based on 2nd highest reading at any station.

[d] Formula $\left[\left(\frac{\text{2nd Highest 24 Hr - 24 Hr Standard}}{\text{2nd Highest 24 Hr}} \right) \times 100, \left(\frac{\text{Annual - Annual Standard}}{\text{Annual}} \right) \times 100 \right]$

For calculations, National Standards were used.

[e] The most adverse air quality reading for this AQCR is less than 1/2 the applicable standard, therefore % reductions were not calculated in order to not mislead the reader with unrealistic percentages.

SO_2 - background is assumed to be zero.

Table A-6. Louisiana - Fuel Combustion Source Summary

AQCR Name	AQCR #	Louisiana Power Plants		Other Fuel Combustion Point Sources[b]	
		NEDS[b]	FPC[c]	Particulate	SO_2
Monroe-El Dorado[a]	019	2	2	9	9
Shreveport-Texarkana-Tyler[a]	022	3	2	13	8
Southern Louisiana-S. E. Texas[a]	106	18	17 [d] 2 (1974) 1 (1975) 1 (1976) 1 (1978) 1 (after 1978)	80	34

a) Interstate
b) From NEDS data in bank as of June 1974 (Rank Order Listing).
c) FPC data retrieved from EPA data banks.
d) Number of power plants planned to go on line on the dates indicated.

Table A-7. Emissions Summary, SO_2 - Louisiana[a]

AQCR	(10^3 Tons/Year) Total	% From Fuel Combust.	Emissions from Fuel Combustion (10^3 Tons/Yr)	Electricity Generation		Point Source Fuel Combustion		Area Source Fuel Combustion	
				(10^3 Tons/Year)	%	(10^3 Tons/Year)	%	(10^3 Tons/Year)	%
Monroe-El Dorado 019	24.5	18.4	4.5	2.2	9.0	1.8	7.3	0.5	2.0
(La. Portion Only)	15.0	5.49	.824	.006	.04	.391	2.6	0.427	2.8
Sheveport-Texarkana-Tyler 022	65.8	7.3	4.8	1.0	1.5	1.8	2.7	2.0	3.0
(La. Portion Only)	6.35	18.1	1.15	.006	0.09	.314	4.9	.827	13.0
Southern Louisiana S. E. Texas 106	299	10.5	31.4	10.1	3.4	16.3	5.5	5.0	1.7
(La. Portion Only)	162	16.9	27.4	10.1	6.2	13.2	8.1	4.1	2.5
Total Emissions	389.3		40.7	13.3		19.9		7.9	
La. Total Only	183.4		29.4	10.1		13.9		5.4	

[a]Based on NEDS 1972 National Emissions Report

Table A-8. Louisiana Emissions Summary, Particulates[a]

AQCR	Total (10^3 Tons/Year)	% From Fuel Combust.	Emissions from Fuel Combustion (10^3 Tons/yr)	Electricity Generation		Point Source Fuel Combustion		Area Source Fuel Combustion	
				(10^3 Tons/Year)	%	(10^3 Tons/Year)	%	(10^3 Tons/Year)	%
Monroe-El Dorado 019	29.8	45.6	13.6	0.3	1.0	12.5	41.9	0.8	2.7
(La.Portion Only)	16.2	34.2	5.54	.154	1.0	4.84	29.9	0.554	3.4
Shreveport-Texarkana-Tyler 022	162	5.8	9.40	1.2	0.74	5.9	3.6	2.3	1.4
(La.Portion Only)	53.2	9.9	5.27	.140	0.26	3.89	7.3	1.24	2.3
Southern Louisiana S. E. Texas 106	395	10.1	39.9	3.80	0.96	30.5	7.7	5.4	1.4
(La.Portion Only)	350	8.5	29.8	3.20	0.91	21.6	6.2	4.90	1.4
Total Emissions	586.8		62.9	5.3		48.9		8.5	
La. Total Only	419.4		40.6	3.5		30.3		6.7	

[a]Based on NEDS 1972 National Emissions Report

Table A-9. Fuel Combustion Regulations - Louisiana

	Existing Sources	New Sources
Particulates	The applicable regulation makes no distinction between new and existing sources, nor between different kinds of fuels. Particulate emissions limited to 0.6 lbs/10^6 Btu heat input Same limits apply when products or by-products of a manufacturing process are burned in conjunction with any fuel.	
SO_x	The part of the sulfur oxides emissions control regulations for fuel burning equipment applies to both new and existing equipment. Two limits on emissions are in effect: There should be no emissions which: 1) Cause ambient air beyond the premises where the source is located to exceed federal ambient air quality standards for SO_2. 2) Have discharge gases with SO_2 concentrations greater than 2000 PPM by volume at standard conditions.	

a) As described in the following sections of the Louisiana Air Control Commission's, Air Control Regulations (reprinted Aug. 16, 1973)

Particulates: Sections of Regulation 21.0 (Emission of Particulate Matter from Fuel Burning Equipment)

Sulfur Oxides: Sections of Regulation 24.0 (Emission Standards for Sulfur oxides) specifically Section 24.7.4.

Table A-10. Required Emission Reductions - SO_2, Louisiana

SIP					1972 DATA			
AQCR	AQ Measurement Control Value	Emissions (10^3 Tons)	Allowable[b] Emissions (10^3 Tons)	1975 Estimated Emissions After Controls (10^3 Tons)	Percent Reduction Required Based On 1973 AQ Data	NEDS Emissions (10^3 Tons)	Allowable[b] Emissions (10^3 Tons)	Emission Tolerance (10^3 Tons)
019 (La Portion)	-	-	-	-	a	24.5	-	c
					a	15.0	-	c
022 (La. Portion)	-	-	-	-	a	65.8	-	c
					a	6.35	-	c
106 (La. Portion)	220 (AAM)	-	-	-	a	299	-	c
					a	162	-	c

a. It was arbitrarily decided to not calculate % reduction in those cases where the air quality measurement was less than 1/2 the standard because the emission increases projected by this method would be unrealistically high.

b. Based on a proportional change of emissions to air quality.

c. Available air quality data indicates that there is a sizeable potential for allowing the emissions of sulfur oxides to increase in this region. However, if this increase was quantified using the proportional model, the results would be unrealistically high. Therefore, no calculation was made.

Table A-11. Required Emission Reductions - Particulates, Louisiana

SIP					1972 DATA			
AQCR	AQ Measurement Control Value	Emissions (10^3 Tons)	Allowable[a] Emissions (10^3 Tons)	1975 Estimated Emissions After Controls (10^3 Tons)	Percent Reduction Required Based On 1973 AQ Data	NEDS Emissions (10^3 Tons)	Allowable[a] Emissions (10^3 Tons)	Emission Tolerance (10^3 Tons)
019 (La. Portion)	-	-	-	-	25	29.8	22.4	- 7.4
					25	16.2	12.2	- 4.0
022 (La. Portion)	-	-	-	-	38	162	100.4	- 61.6
					4	53.2	51.1	- 2.1
106 (La. Portion)	95 (AGM)	-	-	-	70	395	118.5	-276.5
					33	350	234.5	-115.5

a. Based on a proportional change of emissions to air quality.

APPENDIX B

Tables B-1 and B-2 are the assessment of AQCRs which should be examined for the fuel switching impact on particulate and SO_2 emissions. They also provide an identification of those AQCRs which show little potential for fuel revision or regulation relaxation if ambient air standards are to be attained.

The general criteria for candidacy is covered by the list of questions found at the beginning of Section 2.0. Some of the more important criteria is reflected by the tables in this appendix. These criteria include (1) the breadth of air quality violations, (2) the fraction of total emissions resulting from fuel combustion, (3) proposed AQMA designations, (4) expected attainment dates, (5) total regional emissions, and (6) regional tolerances for emissions increase.

It should be noted that an AQCR may not necessarily need relaxation of regulations in order to accomplish fuel switching. Further, a good candidate in Tables B-1 and B-2 may later show little potential for fuel switching after individual sources are examined. Finally, it is possible that an AQCR may have air quality levels below standard at present and may require more <u>strict</u> regulations than currently exist if all fuel burning sources were converted to dirtier fuels, i.e., "average" emission rate now may be below "average" regulations.

Table B-1. Candidacy Assessment for Relaxation of Particulate Regulations[a]

AQCR	Air Quality[b] # Stations	Air Quality[b] # with Violations	Expected Attainment Date[c]	Any Counties AQMA Designations?	Total Emissions 10^3 tons/yr	% Emission From Fuel Combustion	Tolerance for Emissions Increase (10^3 tons)	Overall Regional Evaluation
019	3	3	7/75	No	16.2	34.2	-4.0	Bad Candidate
022	3	2	7/75	Yes	53.2	9.9	-2.1	" "
106	6	2	7/75	No	350	8.5	-115.5	" "

a) For interstate AQCRs, information on this table applies only to portions inside Louisiana.
b) Violations of secondary standards (24 hr)
c) Attainment of secondary standards

Table B-2. Candidacy Assessment for Relaxation of SO_2 Regulations[a]

AQCR	Air Quality		Expected Attainment Date	Any Counties AQMA Designations?	Total Emissions 10^3 tons/yr	% Emission From Fuel Combustion	Tolerance for Emissions Increase (10^3 tons)	Overall Regional Evaluation[e]
	# Stations[b]	# with Violations						
019	3	0	c	No	15.0	5.49	d	Good Candidate
022	1	0	c	No	6.35	18.1	d	" "
106	7	0	7/75	No	162	16.9	d	" "

a. For interstate AQCRs, information on this table applies only to portions inside Louisiana.
b. Number of stations with bubbler monitors.
c. At the time attainment dates were formalized, air quality in this region was better than that required by air quality standards.
d. Available air quality data indicates that there is a sizeable potential for allowing the emissions of sulfur oxides to increase in this region. However, if this increase was quantified via the proportional model, the results would be unrealistically high. Therefore, no calculation was made.
e. For Louisiana the evaluation here relates to an AQCR's candidacy for increasing SO_2 emissions. Due to the format of the State's emission regulation for this pollutant, it cannot be determined whether this regulation should be a candidate for relaxation.

Table B-3. Statewide Fuel Use at Fuel Combustion Point Sources - Louisiana[a]

Fuel	Power Plants (heat input - 10^6 Btu/hr)	Industrial-Commercial Sources (heat input - 10^6 Btu/hr)	Total
Natural Gas	45780	77863	123693
Oil	5839.8	784.5	6624.3
distillate 1484		26.7	
residual 3647.6		757.8	
oil type unknown 708.2		--	
Wood and Waste fuel (includes wood, bagasse, and other assorted process waste products)	--	2457.3*	2457.3
	51620 total heat input to power plants	81105 total heat input to industrial-commercial sources	132725 **

* Based on a rough estimate of 5000 Btu/pound for wood and wastes used as fuel, and on an annual total of 2,152,500 tons of wood and other wastes being combusted.

**Total heat input to all stationary point source fuel combustion facilities in Louisiana.

APPENDIX C

This appendix provides a characterization of individual power plants by AQCR. Current power plant information used to prepare Table C-1 was obtained from three main sources: (1) Federal Power Commission computerized listings of power plants and their associated fuel use, (2) the National Coal Association's Steam-Power Plant Factors, listing of power plants and fuel use in 1972, and (3) emission data in the NEDS data bank as of June 29, 1974. Fuel schedules for 1973 were extracted from the FPC data (1 above), and this was used in conjunction with NEDS emission data to estimate 1973 emissions for each of the sources. When 1973 fuel schedules were not available, 1972 schedules were used as extracted from NEDS. SO_2 and particulates emissions are those associated with the fuel shown. When actual emissions were not listed in NEDS, AP-42 emission factors were used to estimate SO_2 and particulate emissions, based on fuel schedules.

After the name of each plant is a listing of the fuels for which the plant was designed (from source 2). For the purposes here, it is assumed that when a plant is shown to have dual fuel capability, it is able to use entirely one fuel or the other.

Also shown is the 1975 regulations which are currently applicable to the given plant, taken from Table A-9. (Particulate limits are assumed to be based on the entire heat input of the plant.)

It might be cautioned that AQCR total emissions calculated in the tables of Appendix C (and also Appendix D) may not agree exactly with total emissions represented in Appendix A (Tables A-7, A-8). This is a result of both differing fuel schedules in 1973 compared to previous years and the relative "completeness" of the NEDS data bank.

The units for the annual amounts of fuel used by individual sources in this Appendix are 10^3 gallons for oil, and 10^6 cubic feet for natural gas.

Table C-1. Power Plant Fuel Combustion Point Source Characterization - AQCR 019

County	Plant Name	Fuel Use			Emissions							
					SO_2				Particulates			
					Existing		Allowable		Existing		Allowable	
		Type % Sulfur % Ash	Annual Quantity	Heat Input (10^6 Btu/hr)	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu
Ouachita	L.A. Power & Light 352 MW G	Gas	25721	3083	7	<.01		N/A	194	0.01		0.6
		Oil 1.0%S	1176	20.1	92	1.04		N/A	5	0.06		0.6
	Monroe Utility Comm. 166 MW G	Gas	5467	655	1	<.01		N/A	41	0.01		0.6

Table C-1. Power Plant Fuel Combustion Point Source Characterization - AQCR 022

County	Plant Name	Fuel Use			Emissions							
					SO_2				Particulates			
					Existing		Allowable		Existing		Allowable	
		Type % Sulfur % Ash	Annual Quantity	Heat Input (10^6 Btu/hr)	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu
Caddo	Southwest El.Pwr. Arsenal Hill 170 MW G	Gas	3592	431	1	<.01		N/A	26	0.01		0.6
	Southwest E.Pwr. Lieberman 277 MW G	Gas R.Oil 1.02%S	9547 521	1144 8.9	3 42	<.01 1.07		N/A N/A	71 2.1	0.01 0.05		0.6 0.6
Winn	Minden 25 MW G	Gas	977	117	<1	-		N/A	7	0.01		0.6

Table C-1. Power Plant Fuel Combustion Point Source Characterization - AQCR 106

County	Plant Name	Fuel Use			Emissions							
					SO_2				Particulates			
					Existing		Allowable		Existing		Allowable	
		Type % Sulfur % Ash	Annual Quantity	Heat Input (10^6 Btu/hr)	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu
Rapides	Alex Power Plant 178 MW #2	Oil 0.1%S	370	6.3	3	0.11		N/A	1.5	0.05		0.6
	G	Gas	4547	545	1	<.01		N/A	34	0.01		0.6
St. Charles	LA Power & Light 1251 MW OG	Oil 0.1%S	630	10.8	5	0.10		N/A	3	0.06		0.6
		Gas	63148	7569	19	<.01		N/A	474	0.01		0.6
Evangeline	Central LA Elec. Co. 483 MW G	Oil 0.13%S	2142	36.7	22	0.14		N/A	8.6	0.05		0.6
		Gas	16784	2012	5	<.01		N/A	278	0.03		0.6
St. Mary	Municipal Stm. 33.4 MW OG	Oil 1.0%S	185	3.2	15	1.08		N/A	1	0.07		0.6
		Gas	0		0	-			0	-		-
	Central LA Elec - 868 MW Teche G	Gas	17645	2115	5	<.01		N/A	134	0.01		0.6
Orleans	N.O. Pub Service Market St. 96 MW OG	Gas	1481	178	<1	-		N/A	11	0.01		0.6
Iberville	Glf.St.Utl.Willow 1590 MW OG	R.Oil 0.5%S	137718	2358	5405	0.52		N/A	551	0.05		0.6
		Gas	41563	4982	12	<.01		N/A	313	0.01		0.6

Table C-1. Power Plant Fuel Combustion Point Source Characterization - AQCR 106 (Continued)

County	Plant Name	Fuel Use			Emissions							
					SO_2				Particulates			
					Existing		Allowable		Existing		Allowable	
		Type % Sulfur % Ash	Annual Quantity	Heat Input (10^6 Btu/hr)	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu
Jefferson	LA. Power & Light 1884 MW OG	Oil 0.2%S	36246	621	569	0.21		N/A	145	0.05		0.6
		Gas	79046	9475	24	<.01		N/A	592	0.01		0.6
Lafayette	Lafayette Util. System G 143 MW Walker	Oil 0.11%S	588	10.1	5	0.11		N/A	2	0.05		0.6
		Gas	4748	569	1	<.01		N/A	37	0.01		0.6
	Lafayette Util. System G 43 MW Pinhook	Gas	975	116	<1	-		N/A	6	0.01		0.6
Orleans	N.O. Pub.Serv. 218 MW Paterson OG	R.Oil 1.0%S	20454	350	1606	1.05		N/A	82	0.05		0.6
		Gas	4240	508	1	<.01		N/A	32	0.01		0.6
	N.O. Pub. Serv. 959 MW Michould OG	R.Oil 1.54%S	33054	566	3996	1.61		N/A	132	0.05		0.6
		Gas	23102	2769	7	<.01		N/A	173	0.01		0.6
St. Landry	City of Opelousas G	Gas	1142	137	< 1	-		N/A	9	0.29	0.02	0.6
Calcasieu	Lake Charles* G	Gas	1000	120	4	-		N/A	8	.01		0.6

*Not found in FPC, NEDS only for 1972

Table C-1. Power Plant Fuel Combustion Point Source Characterization - AQCR 106 (Continued)

County	Plant Name	Fuel Use			Emissions							
					SO_2				Particulates			
					Existing		Allowable		Existing		Allowable	
		Type % Sulfur % Ash	Annual Quantity	Heat Input (10^6 Btu/hr)	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu
Calcasieu	Glf.St.Utl. 982 MW OG	D.Oil 0.06%S	86688	1484	408	0.06		N/A	347	0.05		0.6
		Gas	23776	2850	7	<.01		N/A	179	0.01		0.6
East Baton Rouge	Glf St.Util.Sta#2 175 MW OG	R.Oil 1.1%S	17514	300	1512	1.15		N/A	70	0.05		0.6
		Gas	10007	1199	3	<.01		N/A	75	0.01		0.6
	Glf.St.Util.Sta#1 253 MW OG	R.Oil 2.0%	3780	64.7	593	2.00		N/A	15	0.05		
		Gas	43437	5206	13	<.01		N/A	15	<.01		0.6

APPENDIX D

The Table D-1 in this appendix lists individual industrial/commercial/institutional sources of particulates and SO_2 emissions which might show fuel switching potential. The sources are from a NEDS rank order emissions listing.

It should be cautioned that the percent emissions accounted for is different than the "% of fuel use accounted for," It is possible that several potential fuel switch sources could be overlooked by the cutoff point on the emissions (i.e., a reasonable sized natural gas used may emit below our cutoff point in the NEDS rank order list).

No information was available for feasibility of <u>any</u> fuel switching.

The units for the annual amounts of fuel used by individual sources are as follows:

10^3 gallons for oil
10^6 cubic feet for natural gas
tons for wood and other wastes used as fuels

Table D-1. Industrial-Commercial Fuel Combustion Point Source Characterization - AQCR 019

County	Plant Name	Fuel Use			Emissions							
					SO_2				Particulates			
					Existing		Allowable		Existing		Allowable	
		Type % Sulfur % Ash	Annual Quantity	Heat Input (10^6 Btu/hr)	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu
Ouachita	Commercial Solvent	Gas	28100	3368	8	<.01		N/A	253	0.02		0.6
Union	Texico, Inc.	Gas	17500	2098	5	<.01		N/A	157	0.02		0.6
Morehouse	Int'l. Paper Co.	R. Oil 0.95%S	2030	34.8	151	1.0		N/A	23	0.15		0.6
		Gas	83000	9947	25	<.01		N/A	747	0.02		0.6
All	Other	Gas	26944	3230	223	0.02		N/A	7	<.01		0.6
		Wood, Waste fuel	270760	309*	1792*	-		N/A	3658	-		0.6

*Includes Bagasse, process gas, other not specified

Table D-1. Industrial-Commercial Fuel Combustion Point Source Characterization - AQCR 022

County	Plant Name	Fuel Use			Emissions							
					SO_2				Particulates			
					Existing		Allowable		Existing		Allowable	
		Type % Sulfur % Ash	Annual Quantity	Heat Input (10^6 Btu/hr)	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu
Webster	Int'l. Paper	Gas	13000	1558	4	<.01		N/A	132	0.02		0.6
All	Other	R. Oil	379	6.5	4	0.34		N/A	88	3.09		0.6
		Gas	18311	2195	5	<.01		N/A	159	0.02		
		Wood,waste fuel	280800	320	211	-		N/A	3483	-		0.6

Table D-1. Industrial-Commercial Fuel Combustion Point Source Characterization - AQCR 106

County	Plant Name	Fuel Use			Emissions							
					SO_2				Particulates			
					Existing		Allowable		Existing		Allowable	
		Type % Sulfur % Ash	Annual Quantity	Heat Input (10^6 Btu/hr)	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu
Ascension	Borden, Inc.	Gas	25000	2997	8	<.01		N/A	225	0.02		0.6
	Triad Chemical	Gas	13200	1582	4	<.01		N/A	119	0.02		0.6
Beauregard	Boise Southern	R. Oil 0.6%	4820	82.5	227	0.62		N/A	132	0.37		0.6
		Gas	2570	308.0	<1	-		N/A	132	0.10		0.6
Iberville	Dow Chemical	Gas	13200	1582	4	<.01		N/A	119	0.02		0.6
LaFourche	The South Coast	Gas	97900	11735	29	<.01		N/A	881	0.02		0.6
St. Charles	Shell Chemical	Gas	2912	349	1752	1.15		N/A	262	0.17		0.6
St. James	Kaiser Alum&Chem	Gas	19400	2325	6	<.01		N/A	175	0.02		0.6
Washington	Crown Zellerbach	Gas	11700	1402	4	<.01		N/A	105	0.02		0.6
Calcasieu	Olin Corp.	Gas	13690	1641	3	<.01		N/A	123	0.02		0.6
		R. Oil 0.6%S	36960	633	1742	0.63		N/A	425	0.15		0.6
All	Total Other	Gas	263185	31546	40	<.01		N/A	2401	0.02		0.6
		D. Oil	1670	26.7	14	0.12		N/A	10	0.09		0.6
		R. Oil	60	1.03	6	1.33		N/A	<1	0		0.6
	Total Wood, waste fuels, etc.		1601000	1828	8497				18690			

*Includes Bagasse, process gas, other not specified